Education, Economic, and Workforce Development Needs of the Biotechnology Sector

Jeremy Leffler, Chief Operating Officer
Testimony before Senate Select Committee on Biotechnology
Ohlone College, Fremont, CA
October 1, 2010

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Impact of Life Sciences in Northern California

- Approximately 2,300 Companies
- Direct Jobs: 125,000+
- Average Wage: US $72,000
- VC Funding: US $954M (2010 Q2), up 17% from 2009 Q2 – PWC Moneytree
- All Biotech Applications: Agricultural Biotechnologies through Biopharmaceuticals to Devices & Lab Instruments

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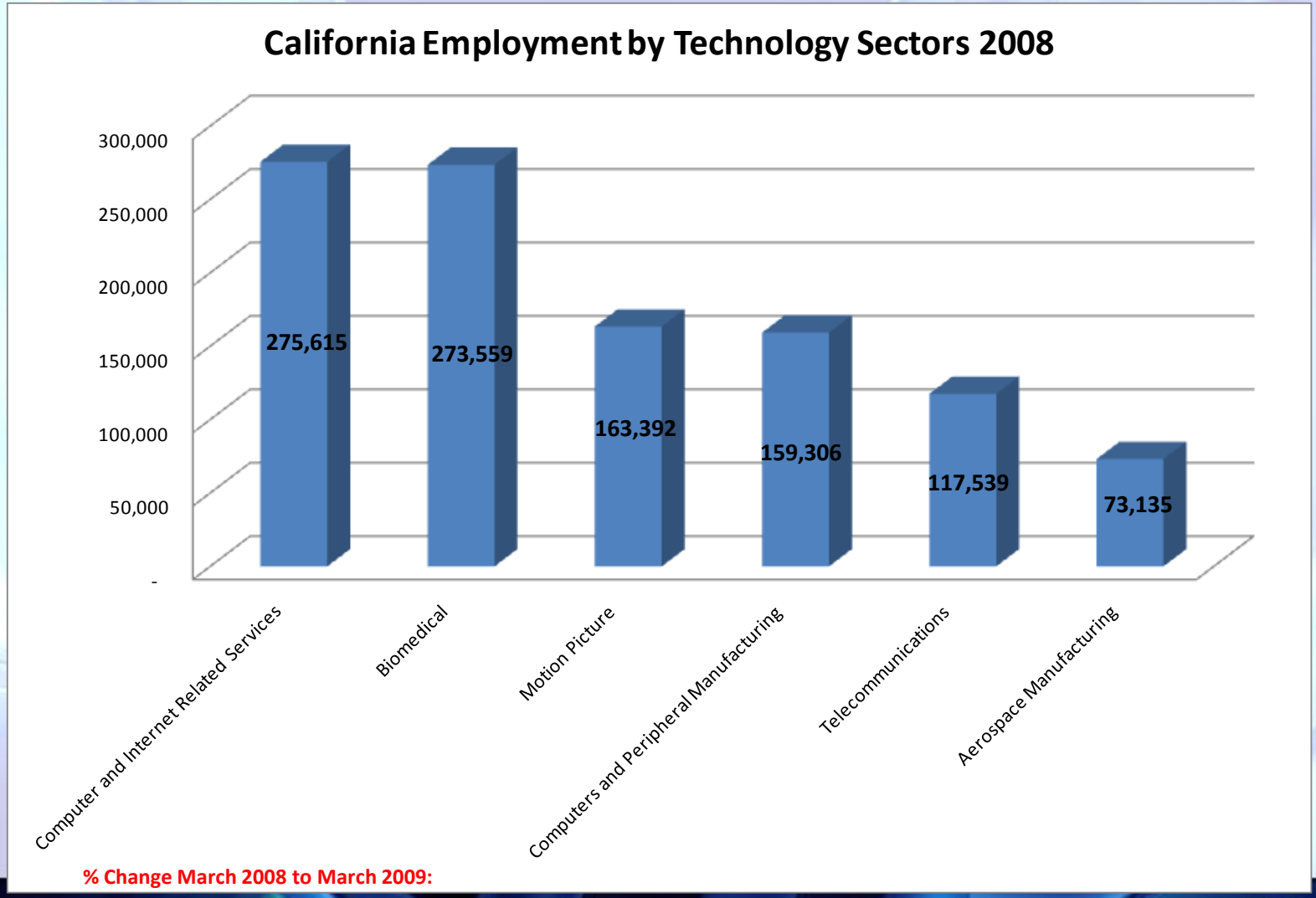
Biotechnology Lags Only Computers as California's Largest Technology Employer



California Healthcare Institute, PriceWaterhouseCoopers: California Biomedical Industry 2010 Report

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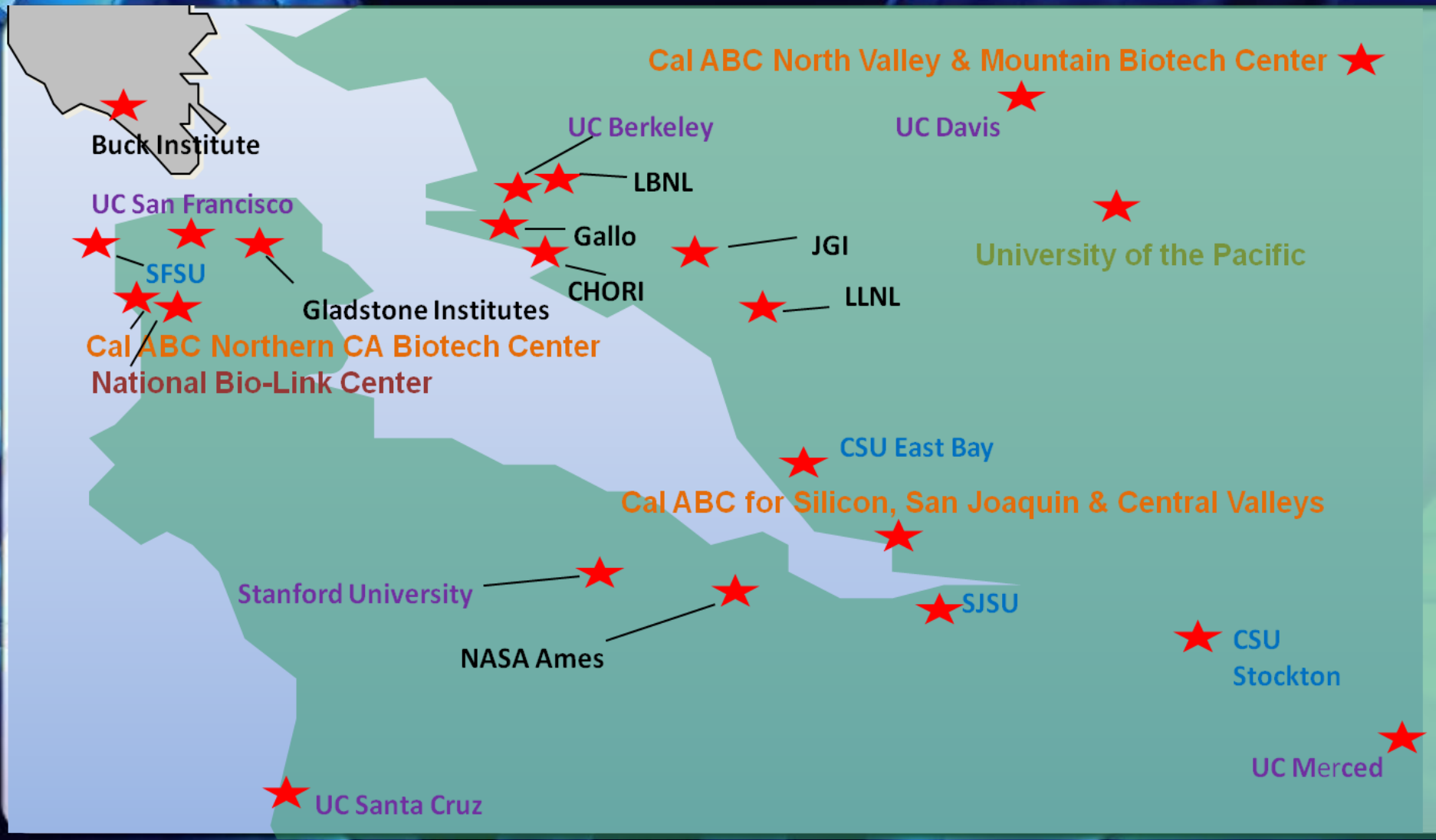
Northern California Research & Workforce Development Infrastructure



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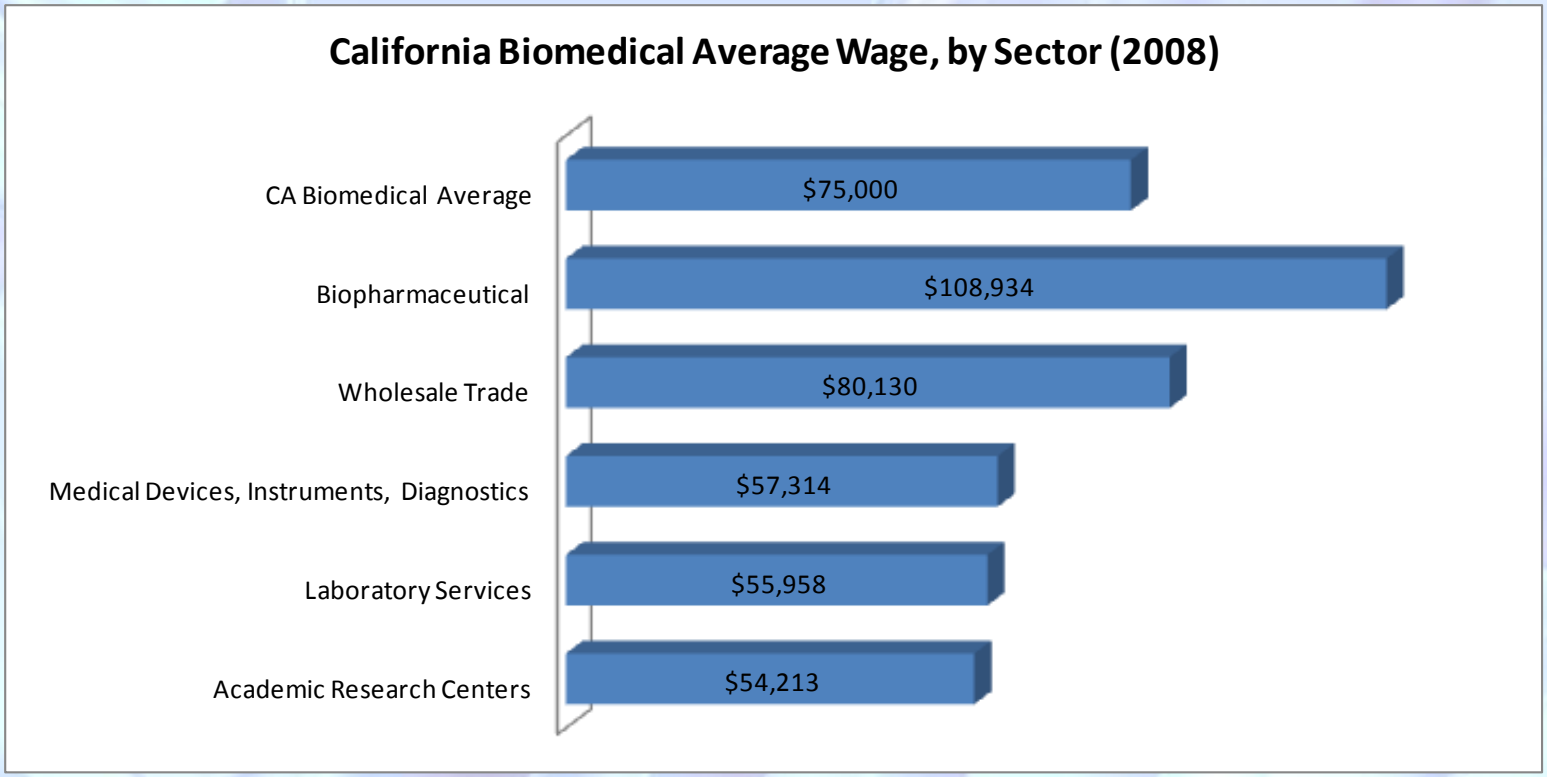
Biomedical Jobs are High-Paying, Especially in Biopharmaceuticals and Wholesale Trade



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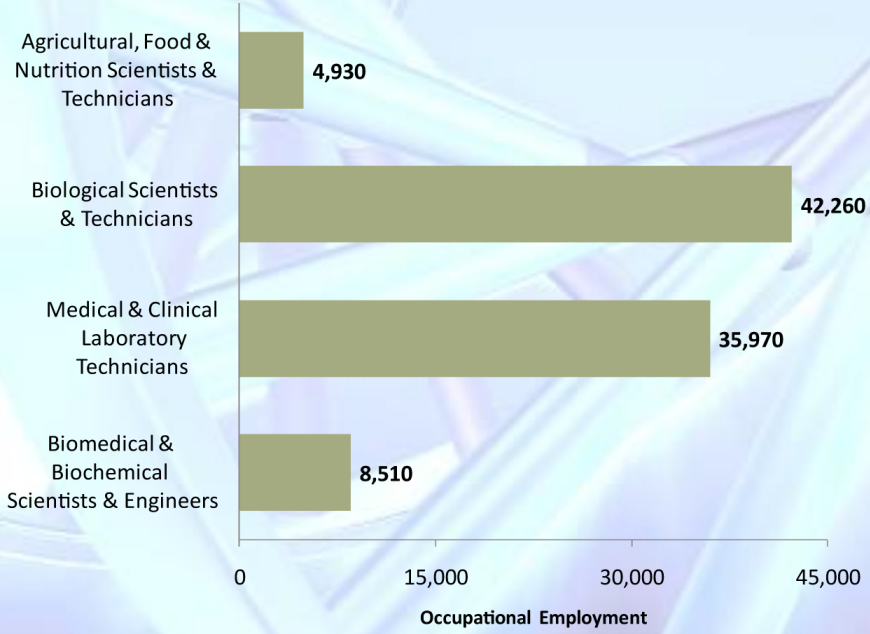
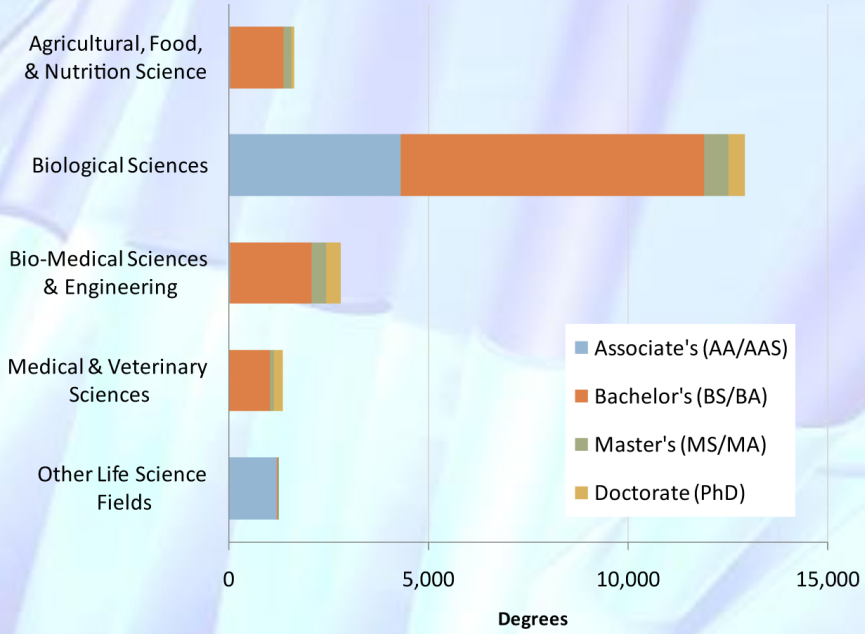
Entrepreneurial Workforce

Bioscience-related Occupational Employment in California, 2008



Bioscience-related Degrees in California, AY 2008



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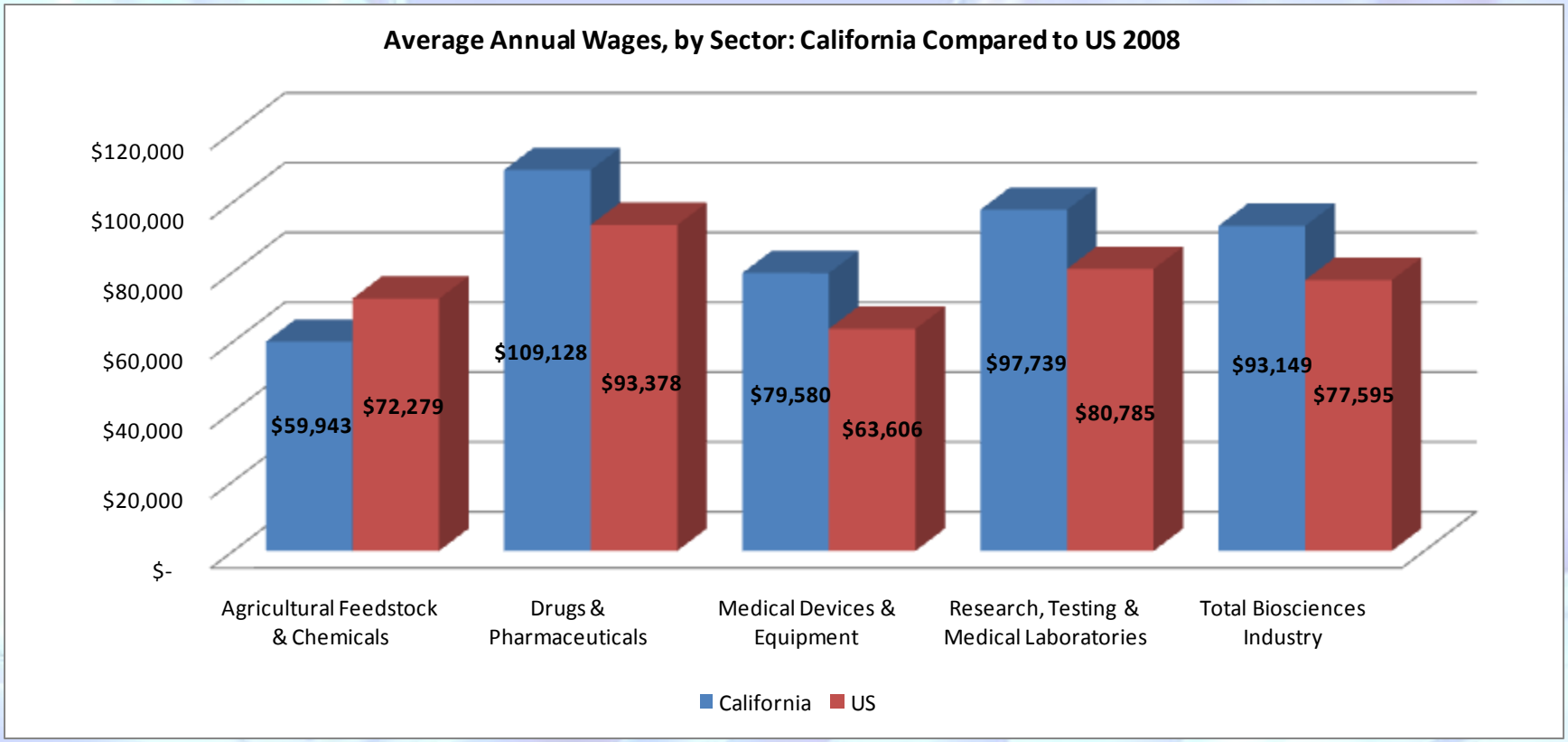
California Bioscience Wages Exceed US Averages, Except in Agricultural Feedstocks & Chemicals



Battelle/Bio State Bioscience Initiatives 2010

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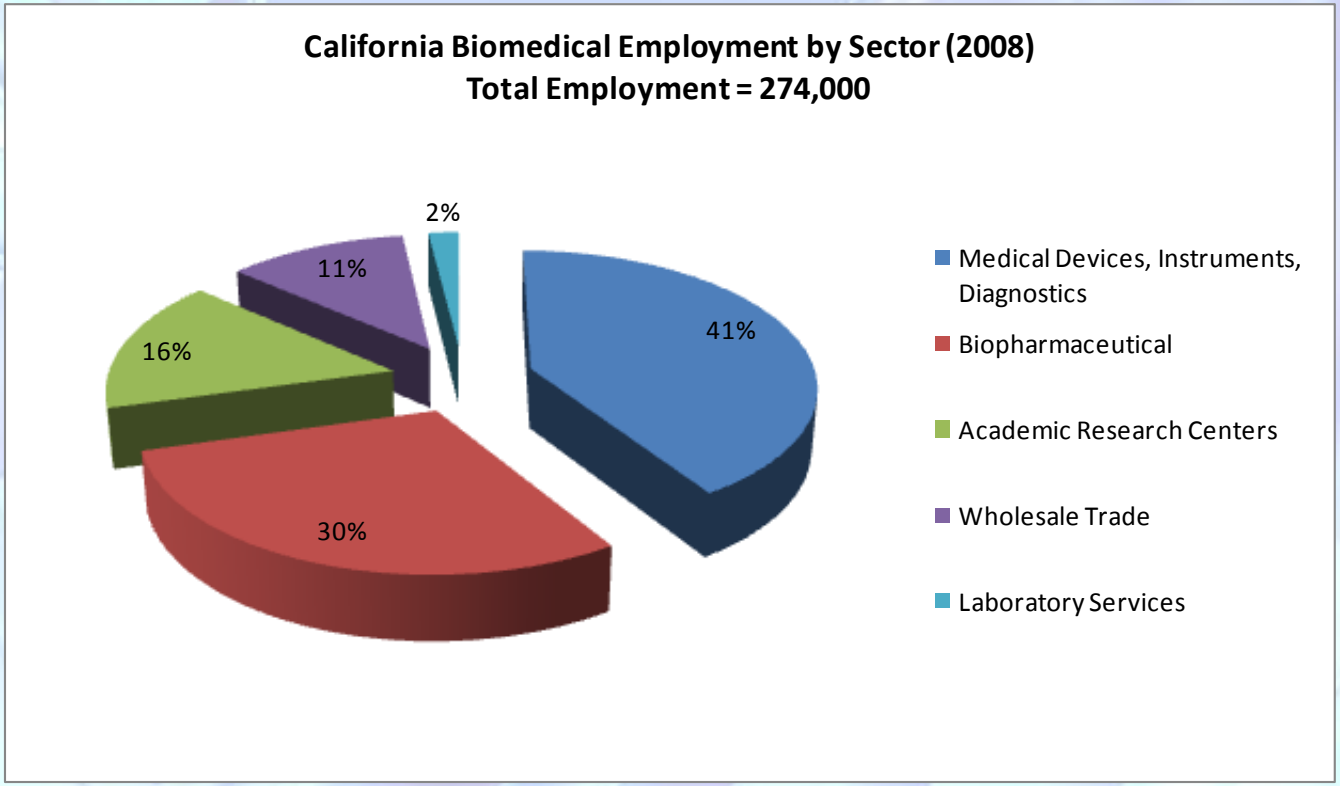
Over 70% of CA Biomedical Employment is in Pharmaceuticals, Devices, Instruments & Diagnostics



California Healthcare Institute, PriceWaterhouse Coopers. California Biomedical Industry 2010 Report

Life Science Performance Metrics

Metrics	California	United States	Rank
Total Employment, 08	221,096	1,420,32	1
# of Establishments, 2008	6,066	47,593	1
Academic R&D Expenditures			
Bioscience R&D	$4.3 billion	$31 billion	1
Bioscience share of Total R&D	62.5%	61.3%	23
Bioscience R&D per capita	$120.16	$104.54	15
Change in Bioscience R%D, FY 2004-08	31%	22.3%	10
NIH Funding, FY 2009			
Total, Including ARRA Funds	$3.8 billion	$25.8 billion	1
Per Capita Funding	$104.22	$84.16	11
Change in Baseline Funding, FY 2004-2009**	-10.7%	-4.7%	41
Change in total funding	7.1%	14.6%	42

*State ranking figures for bioscience industry employment metrics are calculated as quintiles (I=Top Quintile; V=Bottom Quintile).

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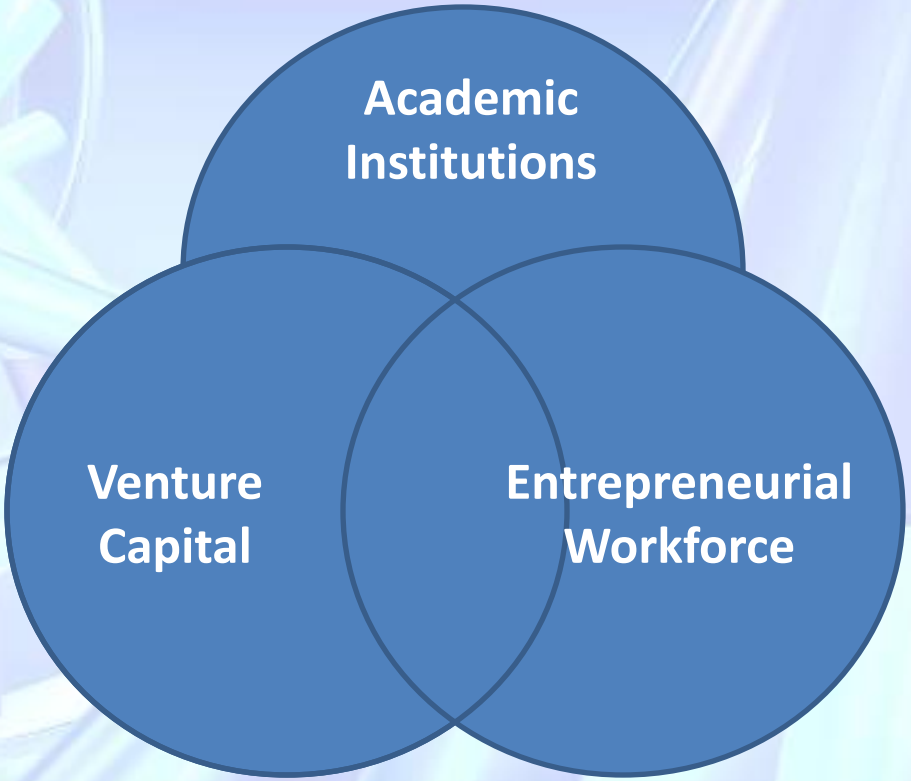
What Makes the Northern California the World's Largest Biotech Cluster?



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…Estimates Indicate a 1% Overall Employment Loss from 2008 to 2009, with Larger Losses in Medical Devices, Instruments, Diagnostics and Wholesale Trade

Trend: 2008 to 2009, By Sector	2008 Employment (Year)	Change: March, 2008 to March, 2009	Percent Change
Medical Devices, Instruments & Diagnostics	111,942	(2216)	-2.0%
Biopharmaceuticals	81,268	252	0.3%
Academic Research	43,038	173	0.4%
Wholesale Trade	31,920	(739)	-2.3%
Laboratory Services	5,390	4	0.1%
California	273,558	(2526)	-0.9%

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Transformative Technologies where Northern California is Positioned to lead

- **Personalized Medicine**
  - Transform the way we diagnose, treat and monitor disease
  - Largest cluster of biomarker, test and sequencing companies here
- **Regenerative Medicine**
  - Stem Cells hold promise for Alzheimer's, CNS, diabetes and other major diseases
  - Large base of academic and industrial research due to Prop 71
- **Digital Medicine**
  - Convergence of IT and biotech provide new opportunities for real time monitoring and how health care is delivered
  - Proximity of Silicon Valley a plus
- **Bioagriculture**
- **Industrial biotech**
  - Biofuels
  - Clean Tech
  - Green Tech

2008-2009 Science and Math Proficiencies*

School District	Science	Math
South San Francisco	38	49
Sequoia Union HSD	42	35
San Mateo County	42	52
Fremont USD	57	64
Hayward USD	15	32
Newark USD	31	43
Oakland USD	19	40
Alameda County	40	49
State	36	46

*California Standards Test

AMONG INDUSTRIAL BIOTECHNOLOGY RESPONDENTS, CALIFORNIA IS PREDOMINANTLY THE LOCATION FOR CORPORATE HQ AND R&D LABS

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California Industrial Biotechnology Workforce Survey
August 2010

CURRENT HIRING: Of the 22 Total Respondents, the Greatest Number of Companies Hired These Functions: Chemists, Molecular/Cell Biologists, Fermentation, Analytics/Testing

Job Function	Employees Currently Hired in Function		Anticipate Hiring More Employees Into Function Over Next 12 Months		Employees for This Job Function are Difficult to Fill	
	% of Respondents	Count	% of Respondents	Count	% of Respondents	Count
Chemists	68%	*15*	68%	*15*	14%	*3*
Molecular/Cell Biologists	64%	*14*	82%	*18*	14%	*3*
Fermentation	55%	*12*	64%	*14*	36%	*8*
Analytics/Testing	50%	*11*	45%	*10*	18%	*4*
Chemical Engineers	45%	*10*	64%	*14*	27%	*6*
Project Managers	45%	*10*	45%	*10*	14%	*3*
Purification	45%	*10*	27%	*6*	9%	*2*
Informatics	45%	*10*	23%	*5*	14%	*3*
Process Engineers	41%	*9*	50%	*11*	14%	*3*
Regulatory Affairs	41%	*9*	18%	*4*	5%	*1*
Manufacturing/Production Technician	32%	*7*	45%	*10*	5%	*1*
Other	32%	*7*	32%	*7*	9%	*2*
QA/QC	27%	*6*	27%	*6*	0%	*0*

Note: “Count” does not refer to number of positions—it refers to the number of respondents who cited this job function. This count does not necessarily correlate with the actual number of employment positions.

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California Industrial Biotechnology Workforce Survey
August 2010

ANTICIPATED HIRING: Of the 22 Total Respondents, the Greatest Number of Companies Anticipate Hiring Molecular/Cell Biologists, Chemists, Chemical Engineers, Fermentation, Process Engineers

Job Function	Employees Currently Hired in Function		Anticipate Hiring More Employees Into Function Over Next 12 Months		Employees for This Job Function are Difficult to Fill	
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California Industrial Biotechnology Workforce Survey
August 2010

JOBS DIFFICULT TO FILL: Of the 22 Total Respondents, the Greatest Number of Companies Expect it to be Most Difficult to Find Fermentation, Chemical Engineers, Analytics/Testing

Job Function	Employees Currently Hired in Function		Anticipate Hiring More Employees Into Function Over Next 12 Months		Employees for This Job Function are Difficult to Fill	
	% of Respondents	Count	% of Respondents	Count	% of Respondents	Count
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Pilot Facilities: Biomass Production, Fermentation, Digesters, Refining or Production

- 50% (9) of respondents currently have Pilot Facilities in CA
  - 33% have Pilot Facilities outside CA
- 50% (9) of respondents intend to keep Pilot Facilities in CA, and 50% intend to expand Pilot Facilities outside CA
  - 7 of 9 respondents with current Pilot Facilities in CA intend to remain in-state
  - 4 respondents with in-state Pilot Facilities intend to remain in CA and expand outside the state
  - 3 with pilot plants outside CA intend to expand outside the state
  - 3 are completely uncertain

Most Pressing Needs in Northern California

- **Access to Capital to fund Innovation**
  - Incentives for private investment
- **Favorable business climate**
  - Tax policies
  - Reduce ‘red tape’
  - Remove unnecessary additional state regulatory and oversight burdens
- **Strong educated workforce**
  - Investments in STEM education
  - Public/private partnerships
  - Industry support

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For More Information

www.baybio.org
www.bio.org/local/battelle2010/
americanmedicalinnovation.org/

www.californiacures.org
www.behindthescienceoflife.com

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